REMARKS

The Examiner's Office Action dated on June 25, 2008 has been received and its contents carefully considered.

In this Amendment, claim 31 has been amended to define the subject matter more specifically, with clear support by the specification as filed, including Figs. 4 and 7 and pages 4-7. Claims 37-42 have been added to further protect the subject matter of the invention, with the support from the specification and drawings as filed including pages 4-7 and FIGS. 4-8. Claims 38-39 depend from claims 1 and 4 respectively and relate to a waveform of the speaker driving signal, with support in the specification as filed being found in Figs. 4-5 and pages 4-7. Claims 40 and 41 are independent claims, wherein claim 41 is also supported by the originally filed specification and drawings, including pages 4-7 and FIGS. 6 and 7. Thus, no new matter is introduced.

Applicants acknowledge with appreciation that claims 17-21 are allowable and that claims 5-9 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

For at least the following reasons, reconsideration of claim 1, 2, 4, and 31-36 is respectfully requested. It is respectfully submitted that the pending claims are in condition for allowance.

Claims 1, 2, 4, and 31-36 stand rejected under 35 U.S.C. §102(e) as being anticipated by Chester (US6,014,055A). Applicants respectfully traverse this rejection because the Chester patent fails to disclose or suggest a driving method for converting digital sound data into corresponding driving signals to drive a speaker, including the step of:

> converting said second data group into a <u>second</u> driving signal according to said second data group and under the control of a <u>second</u> input signal based on said first driving signal, wherein the magnitude of said <u>second</u> data group is represented by pulse height of said <u>second</u> driving signal.

The reason is that the alleged second data group, second input, and first driving signal of Chester do not meet the limitation that the second data group is converted into the second driving signal under the control of the second input signal based on the first driving signal, as recited in claims 1 (with similar recitations in claim 4).

In the rejection of claim 1, the Office Action alleges that Chester discloses:

> "converting said second data group (K LSB's) into a second driving signal according to said second data group and under the control of a second input signal (ENABLE from 37) based on said first driving signal (ENABLE is based on the first driving signal; col. 7, lines 51-56), wherein the magnitude of said second data group is represented by pulse height of said second driving signal."

It is apparent form this passage that the Office Action regards K LSB's, PWM, and "ENABLE from 37" of Chester as a second data group, a first driving signal, and a second input signal, respectively. However, the Official Action fails to address the fact that the second data group is recited as being <u>converted into a second driving signal under the control the second input signal based on the first driving signal</u>. The alleged second data group, first driving signal, and second input signal of Chester do not correspond to the claimed second data group, first driving signal, and second input signal because the second data group is <u>not</u> converted into a second driving signal under the control of the second input signal based on the first driving signal.

Instead of describing the claimed conversion, the cited passage (col. 7, lines 51-56 as well as FIG. 7), relied on by the Office Action, merely states that:

> In the case of the illustrated embodiment and example, the PCM to PWM converter 37' turns on a pulse for 11 clock counts, and **enables the LSB processing circuit output one clock edge after those 11 clock periods**. The LSB processing generates an output half of the way into the first enabled clock time, and turns off its output as shown in FIG. 7.

It is respectfully submitted that this passage cannot reasonably be said to teach "**converting said second data group into a second driving signal** . . . **under the control of a second input signal based on said first driving signal**, wherein the magnitude of said second data group is represented by pulse height of said second driving signal." Instead, the passage clearly teaches that **the LSB processing circuit** <u>is enabled</u> by the PCM to PWM converter 37' so as <u>to output</u> **one clock edge after those 11 clock periods**, which is not at all the same as teaching <u>conversion of K LSBs</u> nor <u>the ENABLE signal</u>, *i.e.*, a pulse for 11 clock counts, <u>being based on the PWM signal output from the PCM to PWM converter 37'</u>.

The Examiner's misinterpretation of Chester's **LSB processing means** is made clear from the following passages elsewhere in the Chester patent:

> "The amplifier 30 also includes **LSB processing means for proportionally altering the PWM signal from the PCM to PWM converter 37 based upon the K LSBs signal to define a PWM output control signal** which is input to the illustrated switch driver 45" (col. 4, lines 34-39); and

> "In the illustrated embodiment, **the LSB processing means** comprises a sawtooth wave generator 42 for generating a sawtooth wave signal; a digital-to-analog converter (DAC) 43 **for converting a signal related to the K LSBs magnitude signal into an analog signal**; and **a comparator 44 for generating a threshold signal based upon a**

> **comparison of the sawtooth wave signal and the analog signal**" (col. 4, lines 58-64).

While these passages mention conversion of the K LSBs (the alleged second data group), the conversion of the K LSBs of Chester is completely different from **the conversion of the second data group into the second driving signal, as recited in claim 1**. In fact, the DAC 43 **converts a signal related to the K LSBs magnitude signal into an analog signal, <u>not under control of any signal based on the PWM signal outputted from the PCM to PWM converter 37</u>**. As a result, Chester actually does not disclose that the conversion of the K LSBs magnitude signal into an analog signal by the DAC 43 is **<u>under the control of ENABLE signal 24</u>** (see also how the DAC 43 is illustrated in FIG. 4 of Chester).

Further, in contrast to the above-indicated features of claim 1, Chester discloses that the **LSB processing means is for proportionally <u>altering the PWM signal</u> from the PCM to PWM converter 37 <u>based upon the K LSBs signal</u> <u>to define a PWM output control signal</u>**.

Therefore, Chester fails to teach or even suggest the above-indicated features of "**converting said second data group into a second driving signal according to said second data group and <u>under the control of a second input signal based on said first driving signal</u>, wherein the magnitude of said second data group is represented by pulse height of said second driving signal**," as recited in claim 1.

For at least the above reasons, it is respectfully submitted that claim 1, as well as claim 2 dependent from claim 1 and independent claim 4, is not

anticipated, or rendered obvious, by Chester, and the rejections should be withdrawn.

Regarding claim 31, claim 31 now recites, among other features, that:

> corresponding to a value represented by a plurality of bits of the first digital signal, the first driving signal has a waveform including:
> a first pulse whose pulse height according to the first part of the first driving signal; and
> a second pulse whose pulse width according to the second part of the first driving signal.

It is respectfully submitted that Chester fails to disclose or suggest at least the respective first and second pulses of the first driving signal waveform, as recited in claim 31.

It is noted that Chester discloses that "The amplifier 30 also includes **LSB processing means for proportionally altering the PWM signal from the PCM to PWM converter 37 based upon the K LSBs signal to define a PWM output control signal** which is input to the illustrated switch driver 45" (col. 4, lines 34-39). Specifically, Chester discloses that:

> As will be readily appreciated by those skilled in the art, the combination of the DAC 43, comparator 44, and sawtooth waveform generator 42 described herein could be replaced with any device/circuit that generates **an output signal delayed from a time reference, where the delay is linearly proportional to the input digital value**. (col. 6, lines 34-39)
>
> Once the output of the comparator 44 is gated by the enabling signals described above, **it is ORed with the output of the PCM to PWM converter 37 in the illustrated OR gate 77 to form the desired final pulse width**. It is assumed that the two input signals to the OR gate 77 are synchronized by the clock extraction circuit 53. The switch driver 45 translates the PWM signal into a format compatible with the actual power switches 47. As also illustrated, the power switches 47 may be coupled to a transducer, such as the illustrated loudspeaker 48 via the illustrated low pass filter 49 as will be readily appreciated by those skilled in the prior art. (col. 6, lines 40-52)

From this teaching, it is clearly that Chester's PWM output control signal is **a PWM signal** whose pulse width is formed by OR-ing **the output of the PCM to PWM converter 37 with the output of the comparator 44, as required**. As such, the waveform of the alleged "first driving signal" of Chester cannot possibly meet the positively recited limitation that:

> corresponding to a value represented by a plurality of bits of the first digital signal, the first driving signal has a waveform including:
> a first pulse whose pulse height according to the first part of the first driving signal; and
> a second pulse whose pulse width according to the second part of the first driving signal, as recited by claim 31.

For at least the above reasons, it is respectfully submitted that claim 31, as well as claims 32-36, is neither anticipated, nor rendered obvious, by Chester and the rejections of claims 31-36 should be withdrawn.

Further, new claims 38-39, depending from claims 1 and 4 respectively, are believed to be allowable because the Chester patent clearly does not disclose or suggest that **the second data group is converted into a second driving signal** according to said second data group and **under the control of a second input signal based on said first driving signal**, wherein the magnitude of said second data group is represented by pulse height of said second driving signal, as recited in claim 1 or 4, and **the speaker driving signal has a waveform, corresponding to said digital sound data, including: a first portion with a pulse width according to said first driving signal and a second portion with a pulse height according to the said second driving signal**, as recited in claim 38 or 39.

Finally, it is respectfully submitted that each of the new claims recites at least one of the allowable features described above and/or additional features that are not disclosed or suggested by the Chester patent.

Conclusion

For the foregoing reasons, it is respectfully submitted that this application, as amended, is in condition for allowance. Notice of such allowance and passing of the application to issue, are earnestly requested.

Should the Examiner feel that a conference would be helpful in expediting the prosecution of this application, the Examiner is hereby invited to contact the undersigned counsel to arrange for such an interview.

Respectfully submitted,

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